CLAIMS

1) A process intended for regeneration of a used absorbent from a desulfurization zone or of any gas containing sulfur oxides, said regeneration being carried out simultaneously with filtering of said absorbent in a reducing atmosphere, characterized in that it consists in carrying out partial combustion of a regeneration gas upstream from said regeneration and in that the products of said partial combustion are mixed with the used absorbent prior to the regeneration-filtration stage.

2) A process as claimed in claim 1, characterized in that it further consists in mixing an additive regeneration gas during the regeneration-filtration stage.

3) A process as claimed in any one of claims 1 or 2, characterized in that said regeneration gas comprises hydrogen sulfide and/or a hydrocarbon.

4) A process as claimed in any one of the previous claims, characterized in that the gases from the regeneration-filtration stage are cooled.

5) A process as claimed in claim 4, characterized in that the cooled gases are sent to a Claus plant.

6) A process as claimed in any one of the previous claims, characterized in that the regenerated absorbent from the regeneration-filtration stage is mixed with a carrier gas, then sent to a storage unit.

7) A process as claimed in any one of the previous claims, characterized in that the regenerated absorbent is mixed with a carrier gas, then sent to a desulfurization zone.

8) A process as claimed in any one of the previous claims, characterized in that regeneration is carried out in the presence of a catalyst.

9) A process as claimed in claim 8, characterized in that the catalyst used for said regeneration stage comprises copper oxide and/or cerium oxide.

10) A process as claimed in any one of the previous claims, characterized in that the used absorbent is fractionated, prior to being mixed with the regeneration gas, into at least two fractions, some of said fractions being rich in catalyst, the others being poor in catalyst.

11) A process as claimed in claim 10, characterized in that said catalyst-rich fractions are recycled to a desulfurization zone, and said catalyst-poor fractions are directly sent to the regeneration zone.

12) A process as claimed in claim 10, characterized in that said catalyst-rich fractions are recycled to a desulfurization zone, and said catalyst-poor fractions are separated into two streams, one being recycled to a desulfurization zone, the other being sent to the regeneration zone.

13) A process as claimed in any one of the previous claims, characterized in that the used absorbent is temporarily stored prior to being mixed with the regeneration gas.

14) A device intended for regeneration of a used absorbent from a thermal desulfurization zone, comprising a regeneration means (12) working in a reducing atmosphere by contacting a regeneration gas with the used absorbent, associated with a filtration means, said means (12) comprising an inlet for the used absorbent, an outlet for the gases, an outlet for the regenerated absorbent, characterized in that it further

comprises a means (14) intended for partial combustion of the regeneration gas and a means for mixing the regeneration gas with the used absorbent, arranged upstream from the used absorbent inlet of regeneration means (12).

15) A regeneration device as claimed in claim 14, characterized in that regeneration means (12) also comprises an additional inlet (16) for a regeneration gas.

16) A regeneration device as claimed in any one of claims 14 or 15, characterized in that it also comprises a means (18) for cooling the gases coming from regeneration means (12), whose inlet is connected to the gas outlet.

17) A device as claimed in claim 16, characterized in that cooling means (18) comprises an outlet (19) connected to the inlet of a Claus plant.

18) A device as claimed in any one of claims 14 to 17, characterized in that it also comprises a filtering means (1) intended to separate the used absorbent from the effluents prior to entering regeneration-filtration means (12), said means (1) being arranged upstream from the regeneration means in relation to the direction of flow of the absorbent.

19) A device as claimed in any one of claims 14 to 18, characterized in that it also comprises a means (9) intended for storage of the used absorbent, said means being arranged upstream from the used absorbent inlet of regeneration means (12).